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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/612,060

07/01/2003

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EXAMINER

TUCKER, WESLEY J

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

09/07/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/612,060	Applicant(s) FAN, ZHIGANG	
	Examiner Wes Tucker	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16-20 is/are allowed.
- 6) ☒ Claim(s) 1,2,5-10 and 13-15 is/are rejected.
- 7) ☒ Claim(s) 3,4,11 and 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 18th, 2007 has been entered.

Response to Amendments

2. Applicant's response filed July 18th 2007 has been entered and made of record.
3. Applicant has amended claims 1, 10 and 16. Claims 1-20 remain pending.
4. Applicant's remarks in view of the newly presented amendment have been fully considered but are now moot in view of the new rejection presented below.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2624

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-2 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,956,157 to Tai.

With regard to claim 1, Tai discloses a method for reducing boundary effects in images with mixed screen patterns, comprising:

Halftoning an original contone image, resulting in a halftone image with a plurality of halftone portions, each halftone portion comprising a portion of the image halftoned by a halftone, at least two halftone portions comprising portions of the image halftoned by different halftones (column 5, lines 53-67). Tai teaches halftoning different portions of the image according to image data within each portion.

Tai further discloses adjusting boundary regions located between halftone portions of the halftone image to minimize a brightness deviation between the boundary regions and the original contone image (column 5, lines 60-67 and Abstract). Tai teaches that in regions at the boundaries of two different dot regions a process of blending of the different rendering processes for the two regions is used to reduce the appearance of sharp changes between regions.

With regard to claim 2, Tai discloses the method according to claim 1 for reducing boundary effects in images, wherein adjusting boundary regions comprises:

Performing a low-pass filtering of halftones in the boundary regions, a boundary region having a width that is one or more pixels wide (column 5, lines 60-67 and

Abstract). Tai teaches that the boundary regions between different half-tones are blended together to lessen the appearance of sharp changes between regions. In image processing this is effectively a low-pass filter since the high frequency data or sharp edge is blurred. Therefore Tai effectively performs low-pass filtering in the boundary regions between the different halftones.

With regard to claim 10, the discussion of claims 1 and 2 apply.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 5-9 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patents 5,956,157 to Tai and 5,822,469 to Silverstein.

With regard to claim 5, Tai discloses the method as claimed in claims 1 and 2 but does not explicitly disclose comparing a filtered portion of the halftone image to a corresponding portion of the original contone image and generating an error map

Silverstein discloses comparing a filtered portion of the halftone image to a corresponding portion of the original contone image and generating an error map (column 5, lines 10-20). The gradients of the halftone and corresponding original contone image are compared. The error map is effectively where the signs of difference don't match up and have to be switched by swapping pixels in the halftone image.

Both Tai and Silverstein are implemented with the purpose of lessening the appearance of edges or gradients. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to use the correction process of Silverstein in combination with Tai to correct the boundary regions with relation to the original contone image.

With regard to claim 6, the discussion of claim 5 applies. There is an error at each pixel location where the calculated differences are opposite and are accordingly switched.

With regard to claim 7, Silverstein discloses the method according to claim 6 for reducing boundary effects in images, further comprising:

adjusting pixels in the boundary regions to reduce a magnitude of errors stored in the error map that correspond to the pixels (column 3, lines 1-10). The comparison and swapping of pixels in border or edge regions is interpreted as reducing the magnitude of errors. The errors being if the differences do not match in sign, they are corrected. The

pixels and errors are mapped as they must correspond in both the halftone and contone images.

With regard to claim 8, the discussion of claim 7 also applies. Silverstein disclose processing pixels in sequence (column 3, lines 46-58).

With regard to claim 9, the discussions of claims 7 and 8 apply. Silverstein discloses that the magnitude of error is determined by setting the threshold, meaning certain errors are processed before or instead of others according to the magnitude in pixel difference in the edge or border regions according to the specified threshold (column 4, lines 42-52).

With regard to claims 13-15 the discussions of claims 7-10 apply.

Allowable Subject Matter

6. Claims 16-20 are allowed.

The following is an examiner's statement of reasons for allowance:

With regard to claim 16, Tai teaches the method as claimed in claims 1 and 10 of halftoning an image in portions by different halftones and effectively low-pass filtering the boundary regions of those half-tones by blending and blurring the edge regions. However, Tai does not teach or fairly suggest choosing a cut-off frequency for the low-

pass filtering. No other found prior art teaches or suggests choosing a cut-off frequency in such a way as to be combinable with Tai.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Claims 3, 4, 11, 12 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 3, 4, 11 and 12 contain allowable subject matter as discussed with regard to claim 16 above.

Contact Information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wes Tucker whose telephone number is 571-272-7427. The examiner can normally be reached on 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Bella can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Wes Tucker

8-29-07



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